

DOCTORAL CANDIDATE: Ana Kucera
DEGREE: Philosophiae Doctor
FACULTY: Faculty of Mathematics and Natural Sciences
DEPARTMENT: Department of Biosciences
AREA OF EXPERTISE: Cell biology
SUPERVISORS: Oddmund Bakke, Tone F. Gregers, Jan Terje
Andersen and Cinzia Progida
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DISSERTATION TITLE: *Characterization of novel trafficking pathways from the trans-Golgi network to the endosomal compartments*

The digestive system of a cell is composed of a network of small membrane enclosed compartments (endosomes) that are collectively termed the endosomal system. For functional degradation of cargo, the cells synthesize hydrolytic enzymes that are transported to endosomes. The cargo contains a range of extracellular particles such as nutrients or signaling molecules, however, potential pathogens may also be present. Fragments of the potentially harmful particles can be bound by the specific protein complexes (MHC proteins). The combination of the MHC protein complexes and degraded fragments may further be used to trigger a protective immune response. The synthesis of enzymes or MHC, and endosomal degradation take place at different locations within a cell. Nevertheless, it is imperative for cell function to maintain communication across these compartments. The distribution of proteins and enzymes can collectively be termed "intracellular trafficking" and these events can be studied using imaging techniques. The candidate Ana Kucera will present her work on three proteins important for both the degradative pathway and immune responses, namely: the mannose phosphate receptor (MPR), Rab9 and Invariant chain (Ii). Some of the results led to the development of a novel strategy for therapeutic cancer vaccines which consequently highlights the importance basic research carries for the development of new therapies.